STATE OF MINNESOTA DISTRICT COURT

COUNTY OF RAMSEY SECOND JUDICIAL DISTRICT

- -

The State of Minnesota,
by Hubert H. Humphrey, III,
its attorney general,
and
Blue Cross and Blue Shield
of Minnesota,

Plaintiffs,

vs. File No. C1-94-8565

Philip Morris Incorporated, R.J.
Reynolds Tobacco Company, Brown &
Williamson Tobacco Corporation,
B.A.T. Industries P.L.C., Lorillard
Tobacco Company, The American
Tobacco Company, Liggett Group, Inc.,
The Council for Tobacco Research-U.S.A.,
Inc., and The Tobacco Institute, Inc.,

Defendants.

- -

DEPOSITION OF R.J. REYNOLDS TOBACCO COMPANY

(DESIGNEE DAVID TOWNSEND)

Volume IV, Pages 422 - 488

http://legacy.library.ucsf.edu/tid/hhn05a00/pdf
Source: https://www.industrydocuments.ucsf.edu/docs/pfhd0001

(The following is the continued deposition of R.J. REYNOLDS TOBACCO COMPANY (DESIGNEE DAVID TOWNSEND), taken pursuant to Notice of Taking Deposition by Rule 30.02(f), by videotape, at the offices of Dorsey & Whitney, Attorneys at Law, Pillsbury Center South, 220 South Sixth Street, Minneapolis, Minnesota, on October 2, 1997, commencing at approximately 4:12 o'clock p.m.)

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I N D E X

WITNESS	EXAMINATION BY	PAGE
David Townsend	Mr. O'Fallon	426

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P R O C E E D I N G S

(Witness sworn.)

DAVID TOWNSEND

called as a witness, being first duly sworn, was examined and testified as follows:

ADVERSE EXAMINATION

BY MR. O'FALLON:

Q. Could you please state your full name for the record.

A. My name is David Townsend.

Q. And what is your current position?

A. Presently I'm vice president of product development and assessment at R.J. Reynolds Tobacco Company.

Q. And how long have you been with R.J. Reynolds Tobacco Company as an employee?

A. I've been an employee at R.J. Reynolds since October 1977, so that would be almost 20 years.

Q. Okay. Do you understand that you're here today to testify on behalf of R.J. Reynolds as to matters known or reasonably available to R.J. Reynolds concerning research and development -- development activities and the control of nicotine and other reinforcing substances in cigarettes and design and

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manufacture of cigarettes regarding same?
A. I understand that.
Q. And are you ready to so testify?
A. I am.
Q. First of all, I'd like to ask you some questions concerning your compensation at R.J. Reynolds. It's my understanding that your annual compensation at least as a base salary is roughly 135 to 140,000 dollars a year. Correct?
A. I can't give you an exact number, but it's a little bit higher than that.
Q. Okay. How much higher?
A. Since my promotion to vice president, I would say my base salary is in the range of about 150.
Q. Okay. Do you still participate in what's called the AIAP plan?
A. Yes, I do.
Q. And is that an -- an incentive plan?
A. It is. It's an incentive plan that's based on company performance.
Q. Okay. And it's my understanding that you've testified previously that essentially what this plan means is that a proportion of your job value is on the line and made payable to you if the company does well; correct?

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A. That's a reasonable description of it.
Q. Okay. And how much of your job value is on the line? What percentage would your bonus be?
A. Under my current level, the job -- or the AIAP target value would be about 35 percent, I believe.
Q. And whether or not you receive that 35 percent bonus will depend on how well the company does; correct?
A. That's correct.
Q. It's linked directly to the profitability of the company; correct?
A. It's linked to two important measures: operating company contribution and share of market performance.
Q. Share of market performance is going to depend roughly on the number of cigarettes sold; correct?
A. That's correct.
Q. Operating company contribution is basically net profit; correct?
A. Essentially that's correct.
Q. Net profit could be affected by other events; correct?
A. Absolutely.
Q. For instance, if R.J. Reynolds were to lose the current litigation that's pending against it and

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brought on behalf of my client, the State of Minnesota and Blue Cross, Blue Shield, that could certainly negatively impact the operating company contribution; correct?

MR. PLESEC: Objection.

A. I would assume so.

Q. Therefore, you have a direct economic incentive in this litigation.

MR. PLESEC: Objection.

A. I disagree with that.

Q. If your company suffers an adverse verdict here in this litigation and it reduces the operating company contribution to RJR Nabisco, in all likelihood, you will not get your full bonus; correct?

MR. PLESEC: Objection.

A. If something like that were to occur, I would expect that I would not get my full target bonus; however, that is not why I'm here.

Q. Doctor, I'd like to speak for a while about nicotine. Would you agree that what RJR produces and sells is a product, tobacco smoke, and that the key ingredient of that product is nicotine?

MR. PLESEC: Objection.

A. I believe that what we market and -- what we

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manufacture and sell are cigarettes, and a very important -- a very important element of cigarettes is nicotine.

Q. Would you agree that nicotine is a potent drug?

MR. PLESEC: Objection.

A. I believe that nicotine exhibits a pharmacological effect, particularly a mild pharmacology. I believe that it is a naturally occurring material in tobacco, naturally occurring component. I don't agree that it is, in my mind, a drug, however.

Q. "Pharmacological" is a term that's usually used to refer to a drug; correct?

A. I don't know that I would say that. I believe something that has a pharmacological effect has some effect on -- effect on processes in the body.

Q. Specifically nicotine has an effect on numerous processes in the body, including the central nervous system and the cardiovascular system; correct?

MR. PLESEC: Objection.

A. I'm not an expert in this area, but I believe that nicotine has probably a number of mild pharmacology effects, pharmacological effects, on the body.

Q. In fact, the tobacco industry may be thought of

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as being a specialized, highly ritualized and stylized segment of the drug industry; correct?

A. I --

MR. PLESEC: Objection.

A. I don't agree with that at all.

Q. Would you agree that nicotine is known to be a habit-forming alkaloid; hence, the confirmed user of tobacco products is primarily seeking the physiological satisfaction derived from nicotine?

MR. PLESEC: Objection.

A. That's a very complicated question, has multiple parts to it. I do believe, as I said, that nicotine exhibits some mild pharmacology. I don't agree and -- well I'm sorry. I do agree that cigarette smoking can be a habit for many people, but I -- I do believe that nicotine is only one reason that people smoke. It happens to be a very important reason, but it's certainly not the only reason.

Q. Isn't it true that a smoker's choice of product and pattern of usage are primarily determined by his or her individual dosage requirements for this drug, nicotine?

MR. PLESEC: Objection.

A. I don't agree with that at all.

Q. In fact, you at R.J. Reynolds knew this, that a

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smoker was looking for a dosage level of nicotine; correct?

MR. PLESEC: Objection.

A. I don't believe that.

Q. I'm going to hand you a document that's been previously marked as Plaintiffs' Exhibit 1057. Plaintiffs' Exhibit 1057 is a document Bates stamp numbered 50091 5683 through 5691; correct?

A. I'm sorry, I wasn't following those numbers. It's Bates 5683 to 50091 5691. Okay.

Q. And this document is entitled "RESEARCH PLANNING MEMORANDUM ON THE NATURE OF THE TOBACCO BUSINESS AND THE CRUCIAL ROLE OF NICOTINE THEREIN"; correct?

A. That is the title of this document.

Q. It's authored by Claude Teague and it's dated April 14th of 1972; correct?

MR. PLESEC: Objection.

A. It appears to be authored by Claude Teague. It has his signature on it. It's dated April 14, 1972.

Q. And this is a document that's available in RJR's research and development library; correct?

A. I believe it is.

Q. And you've seen this document previously; correct?

A. I have. It's been a while since I've looked at

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it.

Q. Okay. Let's go to the second page of this document. By the way, when -- when we -- when you say that it's available in RJR's research and development library, that means basically anybody in the company had access to it; correct?

A. Well company employees that have a reason to have access for R&D certainly have open access. It's -- it's -- it is an open library for the most part.

Q. So if any of the executives of the company or anybody in R&D felt a need to see this particular document, they could have went to the R&D library, looked it up and obtained a copy or obtained --

A. Well --

Q. -- the document to look at it?

MR. PLESEC: Objection.

A. Let me make it quite clear and specific. A company employee, whether they're an R&D employee or not, can have access to the R&D library if there's a reason to do so. That means a janitor or a secretary who happens to be a company employee but no business-related need to have access to the library would not have access.

Certainly an executive in other departments,

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certainly project leaders or managers in other departments have access to our library.

Q. In other words, this document was reasonably available to RJR employees who would have a need for it; correct?

A. I would think so.

MR. PLESEC: Objection.

Q. Let's look on the first full page of this document after the cover page. Dr. Teague states in the first sentence that "In a sense, the tobacco industry may be thought of as being a specialized, highly ritualized and stylized segment of the pharmaceutical industry"; correct?

A. That's what it says.

Q. He states that "Tobacco products, uniquely, contain and deliver nicotine, a potent drug with a variety of physiological effects"; correct?

MR. PLESEC: Objection.

A. That's what is said here.

Q. And "physiological effects" refers to effects inside the body; correct?

MR. PLESEC: Objection.

A. I would assume so.

Q. Okay. In the next sentence after that starting with "Nicotine," he says that "Nicotine is known to

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be a habit-forming alkaloid" --

A. I'm sorry. Okay, you skipped a sentence.

Q. Yeah, I did.

A. Okay. Okay, go ahead.

Q. It states "Nicotine is known to be a habit-forming alkaloid, hence the confirmed user of tobacco products is primarily seeking the physiological 'satisfaction' derived from nicotine -- and perhaps other active compounds"; correct?

MR. PLESEC: Objection.

A. That's what it says here.

Q. It goes on to state that "His choice of product and pattern of usage are primarily determined by his individual nicotine dosage requirements and secondarily by a variety of other considerations including flavor and irritancy of the product, social patterns and needs, physical and manipulative gratifications, convenience, cost, health considerations, and the like"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. He then writes "Thus a tobacco product is, in essence, a vehicle for delivery of nicotine, designed to deliver the nicotine in a generally acceptable and attractive form"; correct?

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MR. PLESEC: Objection.

A. You've read that correctly.

Q. He goes on to state "Our Industry is then based upon design, manufacture and sale of attractive dosage forms of nicotine, and our Company's position in our Industry is determined by our ability to produce dosage forms of nicotine which have more overall value, tangible or intangible, to the consumer than those of our competitors"; correct?

MR. PLESEC: Objection.

A. You read that correctly.

Q. In the next sentence of the next paragraph he then emphasizes a point he made above by saying, quote, "The habituated user of tobacco products is said to derive 'satisfaction' from nicotine"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. So as early as 1972 it was well known in RJR that nicotine was a habituating drug; correct?

MR. PLESEC: Objection.

A. I think what we have here is Dr. Teague's opinions apparently as he put them down on paper. I wouldn't make the leap across the chasm to any expectation that -- that this was well known or well

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believed or even has any kind of foundation to it.
Q. Well this isn't the first time that you've heard the notion that smokers smoke for nicotine even in the context of RJR documents; correct?
MR. PLESEC: Objection.
A. I would say, in a general sense, I've seen several references to it, a number of references perhaps in various RJR documents, oftentimes authored by Dr. Teague.
Q. But we've seen that notion expressed in a number of documents spanning a number of years, including into the 1990s; correct?
MR. PLESEC: Objection.
A. Well I think there may be a number of references, as I said, to -- to that notion.
Q. Within RJR documents and within the RJR research and development department; correct?
MR. PLESEC: Objection.
A. I think that was probably what I was referring to for sure.
Q. Okay. In front of you are some documents that we've marked previously in a deposition. Would you look at document 4818.
A. I have 4818.
Q. Okay. 4818 is a document that's Bates stamp

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numbered 50930 8455 through 8459, and if you'll just look at the second page of that document, 8456, this refers to a Project XB; correct?

A. That's correct.

Q. And XB was a project to manipulate nicotine in order to obtain a regular-nicotine/low-tar product; correct?

MR. PLESEC: Objection.

A. XB was a project to develop products that have medium nicotine and low tar to respond to the Russell hypothesis.

Q. And the first statement under "What We Know" is, quote, "Nicotine is a key element in providing acceptable taste and satisfaction"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. And that's really quite similar to what Dr. Teague stated almost 20 years earlier; correct?

MR. PLESEC: Objection.

A. I think that's -- there's some relationship. It is different, however.

Q. And again the document you're looking at now, Plaintiffs' Exhibit 4818, is a document that was written in August of 1991; correct?

MR. PLESEC: Objection.

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A. That's right, August 1991 is the date that's on this document.
Q. Okay. Let's go back to Dr. Teague's document. Looking at what's listed as page three at the top of the document, Bates stamp number 5685, and starting with the first sentence of the middle paragraph, Dr. Teague writes "Happily for the tobacco industry, nicotine is both habituating and unique in its variety of physiological actions, hence no other active material or combination of materials provides equivalent 'satisfaction'"; correct?
MR. PLESEC: Objection.
A. That's what it says.
Q. And the reason that's a happy event for the tobacco industry is that smokers basically can't give up the habit and the tobacco industry continues to sell billions of dollars' worth of cigarettes a year; correct?
MR. PLESEC: Objection.
A. I don't -- I don't agree with that conclusion.
Q. Like many drugs, the user of nicotine in cigarettes has to build up a tolerance for that nicotine; correct?
MR. PLESEC: Objection.
A. I'm not an expert in this area. I don't agree

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with that statement.
Q. Well you're aware that many smokers upon first trying a cigarette will get dizzy and nauseous; correct?
MR. PLESEC: Objection.
A. I think that's, in a general sense, probably correct.
Q. And over time they develop a certain tolerance for the nicotine so that they no longer get dizzy and no longer feel nauseous; correct?
MR. PLESEC: Objection.
A. I don't know whether that's a tolerance or not in the -- in the classical sense. I think just from common experience I do believe that a person who doesn't smoke and then -- who is not a smoker and then smokes a cigarette sometimes will get dizzy, but whether that's a tolerance in the sense of that -- the definition of that word, I have no idea.
Q. It's also true, is it not, that over time cigarette smokers tend to smoke more cigarettes?
MR. PLESEC: Objection.
A. I'm not sure that that's true at all.
Q. Okay.
A. I think many smokers in fact decrease their number of cigarettes they smoke. Many smokers, like

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myself, will vary considerably in the number of cigarettes that they smoke.

Q. But isn't it true that U.S. government statistics as well as RJR's own internal research indicates that smokers, for instance, under 20 smoke less than smokers who are 20 to 25 and that smokers 25 to 30 smoke more than smokers 20 to 25?

MR. PLESEC: Objection.

A. I don't recall any data like that.

Q. You've never seen that?

A. I don't recall any data like that.

Q. Let's look at Dr. Teague's document on page four, the bottom of page four, and then the top of page five. The second-to-last line on the bottom of page four states that "Only after experiencing smoking for some period of time do the physiological 'satisfactions' and habituation become apparent and needed"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. It says "Indeed, the first smoking experiences are often unpleasant until a tolerance for nicotine has been developed"; correct?

MR. PLESEC: Objection.

A. You read that accurately.

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Q. Now the fact of the matter was that as of this time period, R.J. Reynolds deliberately played down the role of nicotine; correct?

MR. PLESEC: Objection.

A. I don't view that as correct at all. I think Reynolds has acknowledged the important contribution of nicotine. We've tried to study nicotine in many different aspects, including nicotine pharmacology and kinetics. We've tried to understand the role of nicotine in why people smoke.

I don't think we've tried to downplay its role at all. I do believe that nicotine is in fact a very important element in smoking satisfaction. I do believe it's not the only element.

Q. Let's look on page five at the bottom paragraph, the middle of that bottom paragraph where it says "We have deliberately ...." Do you see that start of that sentence?

A. I see that.

Q. Dr. Teague states, quote, "We have deliberately played down the role of nicotine, hence the non-smoker has little or no knowledge of what satisfactions it may offer him, and no desire to try it"; correct?

MR. PLESEC: Objection.

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A. That's what it says.
Q. It says "Instead, we" must somehow "convince him with wholly irrational reasons that he should try smoking, in the hope that he will for himself then discover the real 'satisfactions' obtainable"; correct?
MR. PLESEC: Objection.
A. You read that accurately.
Q. So in other words, in order to convince people to try to smoke, you have to convince them through wholly irrational reasons, and that's where advertising comes in; correct?
MR. PLESEC: Objection.
A. I don't agree with that.
Q. Let's look on page seven. Dr. Teague states at the top of that page that "If our business is fundamentally that of supplying nicotine in useful dosage form, why is it really necessary that allegedly harmful 'tar' accompany that nicotine? There should be some simpler, 'cleaner', more efficient and direct way to provide the desired nicotine dosage than the present system involving combustion of tobacco or even chewing of tobacco"; correct?
MR. PLESEC: Objection.

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A. You read that accurately.
Q. It says "A conventional 1000 milligram tobacco rod containing about 20 milligrams of nicotine is smoked to produce only about 1.3 milligrams of smoke nicotine, accompanied by about 20 milligrams of 'tar' and 20 milligrams of gas phase" material; "and a substantial part of the 1.3 milligram of smoke nicotine is lost to the smoker via" -- "via exhaled smoke -- surely an inefficient nicotine delivery system"; correct?
MR. PLESEC: Objection.
A. That's what it says.
Q. Dr. Teague is talking here back in 1972 about decupling nicotine from tar; correct?
MR. PLESEC: Objection.
A. That is essentially correct. Dr. Teague, the way I interpret this passage, is essentially speaking to what we've -- we've -- we've referred to as the Russell hypothesis, and in fact this is about -- in 1972 is about the same time Russell was publishing his first paper on his -- his theory about medium-nicotine/low-tar products potentially being reduced-risk products or safer products.
This seems to me to be perhaps Dr. Teague's recasting of that concept. I think there are several

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things in this last passage that you read I don't think that Teague can support. For example, the line "and a part of the 1.3 milligram of smoke nicotine is lost to the smoker via exhaled smoke," I think he was speaking without knowledge of retention efficiencies at that point. "Surely an inefficient nicotine delivery system," I certainly don't -- I don't agree with -- well with the -- with the inefficiency of retention.

Q. The Russell hypothesis is based on the premise that a smoker smokes for a dosage of nicotine; correct?

MR. PLESEC: Objection.

A. My interpretation of the Russell hypothesis is that nicotine is very important to a smoker's acceptance of the product. I don't think Russell when he proposed his hypothesis understood or knew anything significant about the details of compensation, but the notion of compensation and the importance of nicotine was certainly a key element of his theory.

Q. And really that's what Dr. Teague is setting out the foundations for here, this notion that smokers do smoke for a certain dosage of nicotine and thereby would compensate products to obtain that certain

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level of nicotine regardless of the actual delivery within reasonable parameters of the cigarette smoked; correct?

MR. PLESEC: Objection.

A. My interpretation of this passage is that this is a similar reflection of the same idea that Russell was about at the same -- was up to at the same -- roughly the same time, in 1972.

Q. Okay. Let's look at page eight. On page eight Dr. Teague talks about "INDICATED RESEARCH DEPARTMENT ACTIVITIES AND APPROACHES"; correct?

A. That's one section at the bottom of page eight.

Q. Okay. And let's look at number five, which is on page nine. He talks about the -- the desire to "Study means for enhancing nicotine satisfaction via synergists, alteration of pH, or other means, to minimize dose level and maximize desired effects"; correct?

MR. PLESEC: Objection.

A. That's what this says.

Q. And in fact RJR did undertake an extensive research program aimed at maximizing nicotine effect through the alteration of pH; correct?

MR. PLESEC: Objection.

A. I'm not aware of an extensive research program.

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I think various people over the course of -- of a number of years at Reynolds in R&D have had various theories about the role of pH and smoking satisfaction, nicotine yield, the dynamics of smoke generation and a variety of other things. I'm not aware of a massive, large-scale program like you're suggesting, however.

Q. I'm going to hand you a document that's been previously marked as Plaintiffs' Exhibit 1058. Plaintiffs' Exhibit 1058 is a document Bates stamp numbered 51122 3463 through 3484. Do you recognize this document?

A. I do recognize the document.

Q. Okay. The document is entitled "IMPLICATIONS AND ACTIVITIES ARISING FROM CORRELATION OF SMOKE pH WITH NICOTINE IMPACT, OTHER SMOKE QUALITIES, AND CIGARETTE SALES"; correct?

A. That's the title of it.

Q. Let's look at Roman numeral I, which is on page 3465. Are you with me?

A. I'm with you.

Q. Under Roman numeral I, "INTRODUCTION; OBJECTIVES," it states as follows: "This year the continuing, vigorous sales growth of various competitive cigarette brands, especially Marlboro and

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Kool, prompted an intensive study of the physical and chemical properties of those brands as compared with our brands. This was aimed at (1) identifying any significant property differences which might correlate with market performance, (2) measuring and monitoring such differences, and (3) learning how such differences are achieved, permitting us to achieve similar effects in our existing or new brands, if desired"; correct?

MR. PLESEC: Objection.

A. You read that correctly.

Q. Okay. If you'll look at page two, there is a section entitled under Roman numeral III "SMOKE pH AND 'FREE' NICOTINE"; correct?

A. That is under Roman numeral III.

Q. This document states that, quote, "In essence, a cigarette is a system for delivery of nicotine to the smoker in attractive, useful form"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. It says "At 'normal' smoke pH, at or below about 6.0, essentially all of the smoke nicotine is chemically combined with acidic substances, hence is non-volatile and relatively slowly absorbed by the smoker"; correct?

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MR. PLESEC: Objection.

A. That's what it says.

Q. "As the smoke pH increases above about 6.0, an increasing proportion of the total smoke nicotine occurs in 'free' form, which is volatile, rapidly absorbed by the smoker, and believed to be" instant -- "instantly perceived as nicotine 'kick'"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. There's then a chart at the back. "Chart VIII shows how proportion of 'free' nicotine increases as pH goes higher"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. Let's look at Chart Number VIII, and that's at Bates number last four numbers 3479.

A. Okay.

Q. Do you see that chart?

A. I'm there.

Q. And what this basically does is chart the amount of free nicotine as a function of smoke pH; correct?

MR. PLESEC: Objection.

A. Chart VIII is a plot of -- of pH versus, I believe, a calculated percent nicotine that is

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expected to be free nicotine.
Q. Okay. Let's go back to page two of the document, last four Bates numbers 3466.
A. Okay.
Q. Now this whole study was inspired in part by the fact that Marlboro and Kool sales were starting to take off; correct?
MR. PLESEC: Objection.
A. Which whole study are you referring to?
Q. This entire study, the "IMPLICATIONS AND ACTIVITIES ARISING FROM CORRELATION OF SMOKE pH WITH NICOTINE IMPACT, OTHER SMOKE QUALITIES, AND CIGARETTE SALES."
A. My conclusion would be this report and a number of different activities arose out of the reports of a correlation between Marlboro and RJR products or Kool and RJR products.
Q. And specifically, if we go back to the "INTRODUCTION; OBJECTIVES," it indicates that the continuing, vigorous sales growth of various competitive cigarette brands, especially Marlboro and Kool, prompted an intensive study of the physical and chemical properties of those brands as compared with your brands; correct?
MR. PLESEC: Objection.

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A. I believe that's correct.
Q. Let's go back to page two of the document, 3466. In the second paragraph under the "SMOKE pH AND 'FREE' NICOTINE," the author writes "Marlboro and Kool deliver about the same amounts of total smoke nicotine as do our comparable brands (Charts IX and X). However, Marlboro smoke is typically at pH 6.8 to 7.3, and Kool smoke is typically at 6.4 to 6.6, as compared with WINSTON smoke at pH" of "5.8 to 6.0 and SALEM smoke at pH" of "6.0 to 6.2"; correct?
MR. PLESEC: Objection.
A. You've read that correctly.
Q. So this establishes that as of 1972, the pH of Winston smoke, for instance, was 5.8 to 6.0; correct?
MR. PLESEC: Objection.
A. That's the number that's quoted here.
Q. It's stated "Thus, Marlboro and Kool smokes contain more 'free' nicotine than our comparable brands, hence would be expected to show more instantaneous nicotine 'kick' than our brands"; correct?
MR. PLESEC: Objection.
A. That's what it says.
Q. Okay. And then it refers to charts that show

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those relationships; right?

A. Yes.

Q. The third paragraph states "As a result of its higher smoke pH, the current Marlboro, despite a two-thirds reduction in smoke 'tar' and nicotine over the years, calculates to have essentially the same amount of 'free' nicotine in its smoke as did the early WINSTON"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. It says "Over the same period, with some reduction in smoke pH and about two-thirds reduction in smoke 'tar' and nicotine, the calculated amount of 'free' nicotine in WINSTON smoke has decreased by about two-thirds"; right?

MR. PLESEC: Objection.

A. That's what it says.

Q. "Thus, currently the calculated amount of 'free' nicotine in Marlboro smoke is almost three times the amount in WINSTON smoke"; correct?

MR. PLESEC: Objection.

A. You read that correctly.

Q. Let's go to Roman numeral IV. I know that we've got a bad copy of this due to the stamping by R.J. Reynolds. I believe that's titled "SMOKE pH AND

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OTHER SMOKE QUALITIES." Do you see that?

A. I see where you are, and I think that's probably a reasonable assumption.

Q. Okay.

A. It is marked over, isn't it?

Q. It then states "In addition to enhancing nicotine 'kick', increasing the pH (increasing alkalinity) of smoke above about 6.0 causes other changes, particularly when the increase in smoke pH is achieved by adding ammonia to the blend"; correct?

MR. PLESEC: Objection.

A. You read that correctly.

Q. If you then look down at the second sentence after that, it says "It should be noted, however, that if ... smoke pH goes much above 7 at normal total smoke nicotine levels" -- that's 1.1 to 1.6 UGs per cigarette -- "the amount of 'free' nicotine becomes high, and this may cause harshness to the throat"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. So it appears that there's a level of free nicotine that's desirable in smoke, but that like many things you can't go too high. You have to find

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just the right amount; correct?

MR. PLESEC: Objection.

A. I don't know that that's true at all really, that conclusion, from this.

Q. Let's look back on page one, and it's last four Bates numbers 3465.

A. Okay.

Q. There's a section here entitled "HISTORICAL DATA, TRENDS AND BRAND COMPARISONS"; correct?

A. That's correct.

Q. Here they looked at sales data and compared it with certain characteristics, including smoke pH; correct?

MR. PLESEC: Objection.

A. It's been a while since I've read this, this section. In a general sense, I would -- I recall that that's about what they did.

Q. As a matter of fact, the second sentence of the first paragraph states that "It soon became apparent that in recent years, corresponding to recent sales performance, the most significant difference between our brands and Philip Morris brands and Kool has been in the area of smoke pH"; correct?

MR. PLESEC: Objection.

A. That's what it says.

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Q. Now it was believed by R.J. Reynolds that this control of smoke pH was no accident; that is, it was de -- a deliberate attempt by Marlboro and Kool, or more appropriately, by Philip Morris and Brown & Williamson to control the pH levels of their cigarettes; correct?

MR. PLESEC: Objection.

A. Well I think you're asking me to -- to surmise what I think was going on at the time in a number of people's minds. From looking at a number of different references to the correlation between smoke pH and sales volume, I guess I would conclude that there were probably several people at Reynolds in the R&D department who believed that -- that that -- that a correlation between sales volume and pH meant that the increased sales volume was directly a result of the pH difference and that Marlboro and Kool might be intentionally at higher pH levels.

That certainly was a theory that was in a number of people's heads from my reading of the literature.

Q. And specifically if we go down to the third paragraph of this document, close to the middle where it starts with the sentence "All evidence," do you see where I'm at?

A. I see.

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Q. The author here states, quote, "All evidence indicates that the relatively high smoke pH (high alkalinity) shown by Marlboro (and other Philip Morris brands) and Kool is deliberate and controlled"; correct?

MR. PLESEC: Objection.

A. You read that correctly.

Q. Let's also look on page three, and it's Bates number 3467. There's a section Roman numeral V entitled "MARKETING CORRELATIONS AND IMPLICATIONS"; correct?

A. Yes.

Q. The first paragraph states "Putting all of this together, we see that Marlboro (and other Philip Morris brands) as compared with WINSTON, our other brands and most other brands on the market shows: (1) higher smoke pH (higher alkalinity), hence increased amounts of 'free' nicotine in smoke, and higher immediate nicotine 'kick'"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. In the next paragraph the author writes "These differences in nicotine impact and other smoke qualities arising from smoke pH increases would be expected to give rise to differences in consumer

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response, hence market performance"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. "Our preliminary correlations strongly suggest that this is the case and that the vigorous, sustained growth in sales of Marlboro (and other Philip Morris brands) and Kool correlates closely with the increased smoke pH, hence increased 'free' nicotine and nicotine impact of those brands"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. Let's look on page 3468. On page 3468 -- those are the last four Bates stamp numbers -- there's a section entitled Roman numeral VII, "RESEARCH ACTIVITIES, CURRENT AND PLANNED"; correct?

A. Yes.

Q. Under the second paragraph it states that "Methods which may be used to increase smoke pH and/or nicotine 'kick' include: (1) increasing the amount of (strong) burley in the blend, (2) reduction of casing sugar used on the burley and/or blend, (3) use of alkaline additives, usually ammonia compounds, to the blend, (4) addition of nicotine to the blend, (5) removal of acids from the blend,

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(6) special filter systems to remove acids from or add alkaline materials to the smoke, and (7) use of high air dilution filter systems"; correct?

MR. PLESEC: Objection.

A. You read that correctly.

Q. Now in fact R.J. Reynolds did institute at least one of those methods; that is, the addition of ammonia; correct?

MR. PLESEC: Objection.

A. We've used ammonia -- as you and I have talked about before, we've used ammonia in different process tobaccos, not for the purpose of pH manipulation in my estimation.

Q. Were any of the other methods listed in this memo used?

MR. PLESEC: Objection.

A. A number of these methods listed here have been used for various reasons, but in my estimation, not to increase pH.

Q. Okay. You would agree, however, that the use of ammonia will necessarily increase pH and thereby increase the free nicotine and the resulting nicotine kick in the cigarette; correct?

MR. PLESEC: Objection.

A. I think the use of high levels of ammonia

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certainly can increase the measured smoke pH values. There's an uncertain but theoretically reasonable relationship that higher pH values in smoke should increase the fraction of nicotine present in the vapor form or the gas form, the unbound form. We don't know the specific relationship of that, and in any event, at levels that we've used in tobacco -- in our tobacco processing of ammonia or ammonia compounds, I don't believe that -- believe there's been a significant increase in smoke pH from the finished cigarette.

Q. I'd like to next show you a document that's been previously marked as Plaintiffs' Exhibit 1062. Plaintiffs' Exhibit 1062 is a document Bates stamp numbered 50901 8864 through 8865A. Have you seen this document previously?

A. I believe I have. It's been quite a while, though.

Q. Information provided by R.J. Reynolds indicates this document was authored in approximately 1981. Is that consistent with your understanding?

MR. PLESEC: Objection.

A. I can give an approximate time on this. I have no idea who the author is, however. I would say that the -- well let me refer to -- I would say the

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approximate time might be in the early '80s, no later than about '84 perhaps.

Q. Do you recognize this as an internal R.J. Reynolds document?

A. I don't for sure know that this is an RJR document. The time -- the timing of this document, however, I think is something I can put brackets around based on some of the technology that's spoken to here, though.

Q. Okay. And the technology that's spoken to is in large part RJR technology; correct?

A. Yes.

Q. So it would be reasonable to conclude that this is in fact an internal RJR document; correct?

MR. PLESEC: Objection.

A. Well if I were to make my best guess, based on what's said here, I would probably con -- conclude that this is an RJR document.

Q. Okay. And in the process of reviewing various documents in preparation for your testimony and just as an employee at R.J. Reynolds, is this a document you've come across?

A. This document looks very familiar. I can't recall when I saw -- saw it or for what purpose, but there's something -- something about it -- something

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about the content of this that -- that seems familiar.

Q. Okay. At the top it says "TECHNOLOGY: AMMONIATION"; correct?

A. That's correct.

Q. And under "BACKGROUND" it states that "RJR BEGAN WORKING WITH AMMONIATION OF TOBACCO AND TOBACCO BY-PRODUCTS IN THE 1950S, BUT DID NOT APPLY THE TECHNOLOGY"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. It states then that "PHILIP MORRIS BEGAN USING AN AMMONIATED SHEET MATERIAL IN 1965 AND INCREASED USE OF THE SHEET PERIODICALLY FROM 1965 TO 1974"; correct?

A. That's what --

MR. PLESEC: Objection.

A. -- it says.

Q. "THIS TIME PERIOD CORRESPONDS TO ... DRAMATIC SALES INCREASE PHILIP MORRIS" -- strike that.

"THIS TIME PERIOD CORRESPONDS TO THE DRAMATIC SALES INCREASE PHILIP MORRIS MADE FROM 1965 TO 1974"; correct?

MR. PLESEC: Objection.

A. That's what this document says.

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Q. It then states that "THE USE OF AMMONIA TO EXPAND TOBACCO WAS INITIATED BY PHILIP MORRIS IN 1974 AND RESULTED IN AN ADJUSTMENT TO THE PM SHEET MAKING PROCESS"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. It then states that "RJR INTRODUCED AMMONIATED SHEET MATERIAL IN THE CAMEL FILTER PRODUCT IN 1974"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. "BETTER MARKET PERFORMANCE WAS INDICATED IN THE SUBSEQUENT YEARS"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. So it appears that the ammoniation of the Camel filter was successful in increasing the market sales of that product; correct?

MR. PLESEC: Objection.

A. I don't know whether that was a direct relationship or not or whether that was true. I don't know.

Q. It then states that "LOW 'TAR' PRODUCTS AT RJR WERE DESIGNED WITH AMMONIATED SHEET MATERIAL BEGINNING IN 1974"; correct?

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MR. PLESEC: Objection.

A. That's what it says.

Q. Do you know which low-tar products at RJR were designed with ammoniated sheet material beginning in 1974?

MR. PLESEC: Objection.

A. No, I really don't.

Q. Did Vantage use ammoniated sheet?

A. It may have. I don't know.

Q. What other low-tar products did R.J. Reynolds have on the market in 1974?

A. Vantage of course was our first introduction into the low-tar market and in fact was the first successful low-tar product. It was introduced in 1970, I believe. In 1975, thereabouts, we introduced Now, so that's after this time period.

Q. Did Now use ammoniated sheet?

A. I really don't know.

Q. The next document --

The next paragraph states that "RSM STUDIES SHOWED THAT AMMONIATION WAS ONE OF THE MAJOR CONSUMER RECOGNIZED PRODUCT ATTRIBUTES TESTED"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. On the next page, page two or Bates number 8865,

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it states "AMMONIATED SHEET WAS INTRODUCED INTO THE WINSTON KS PRODUCT IN 1979"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. "MARKET TESTS INDICATED SIGNIFICANT PRODUCT IMPROVEMENT"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. There's then a paragraph underneath that called "PRODUCT CHARACTERISTICS"; correct?

A. There's a section called "PRODUCT CHARACTERISTICS," yes.

Q. And the product characteristics include the second bullet, which is "HIGHER SMOKE PH"; correct?

MR. PLESEC: Objection.

A. "HIGHER SMOKE PH" is the second bullet.

Q. The fourth bullet is "CLEANER TASTE WITH MORE FREE NICOTINE"; correct?

MR. PLESEC: Objection.

A. You've read the fourth bullet correctly.

Q. And the fifth bullet is "STRONGER PHYSIOLOGICAL IMPACT WITH LESS HARSHNESS"; correct?

MR. PLESEC: Objection.

A. You've read the fifth bullet -- bullet correctly.

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Q. Thus, as the author of the previous document we have seen indicated, the addition of ammonia resulted in higher smoke pH, more free nicotine and stronger physiological impact or, as he defined it, nicotine kick; correct?

MR. PLESEC: Objection.

A. Or as who defined it as nicotine kick?

Q. Well the previous author of that document, who I believe was Dr. Teague.

A. Oh, okay. Well I got confused mixing across these two documents.

I'm sorry, I'm confused now. What's your question?

Q. Thus, as the author of the previous document we have seen indicated, the addition of ammonia resulted in higher smoke pH, more free nicotine and stronger physiological impact or, as the previous author defined it, nicotine kick; correct?

MR. PLESEC: Same objection.

A. I don't agree with that.

Q. You would agree that "stronger physiological impact" and "nicotine kick," as used in the previous document, are very closely related terms; correct?

MR. PLESEC: Objection.

A. I think for some people that might be the case.

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Q. So based on the research project in the 1970s, RJR added ammonia to its products and the result was higher smoke pH, higher levels of free nicotine and increased physiological impact; correct?

MR. PLESEC: Objection.

A. In commercial products?

Q. Yes.

A. I don't agree with that.

Q. Well the products that were listed in the document you just looked at, 1062, were all commercial products.

A. On page two of the last document we reviewed, Bates number 8865, it says "AMMONIATED SHEET WAS INTRODUCED INTO THE -- INTO THE WINSTON KING SIZE PRODUCT IN 1979. MARKET TESTS INDICATED SIGNIFICANT PRODUCT IMPROVEMENT" and then down at the bottom, as you pointed out, "PRODUCT CHARACTERISTICS," "HIGHER SMOKE PH." We've evaluated historical pH data such as we have, limited data, and there is no increase in Winston King Size smoke pH over the period in 1971 to today.

Q. So this document is wrong?

A. I think the speculation that any change in consumer acceptance of the product because -- that results from ammoniation is a result of change in pH

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is not a correct conclusion. The levels of ammonia addition in processed tobacco are quite low, less than a percent, typically a half a percent or less. At levels of ammonia or ammonia compound addition in that range, I don't believe we significantly affect the pH of cigarette smoke.

Historical examination of pH data for Winston King Size 85 soft pack shows no effects. This pH issue may have been a reasonable hypothesis for a number of people at Reynolds in the R&D department. I think the effect of ammoniation on pH, however, is wrong. Certainly it's theoretically possible if you add enough ammonia, you can increase pH. I don't think that's what's going on in our processed tobaccos.

Q. Do you know who wrote this memo?

A. No, I don't.

Q. You were around in 1981; correct?

A. I was at Reynolds in '81.

Q. Did you ever write a memo to anybody involved in this particular document stating, "You're flat out wrong"?

MR. PLESEC: Objection.

A. No, I didn't.

Q. Did you ever pull anybody aside who was

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expressing this whole notion of smoke pH and say, "Hey, you're just wrong. Don't write that anymore"?

MR. PLESEC: Objection.

A. Well it's interesting you bring that up because we've had many informal discussions about the whole notion of pH, and there are a number of scientists, including myself, who have -- who have very clearly taken the stand in a serious manner and also in a joking manner that we don't understand what pH means. This has gone back to my early days of employment there. In fact, there was a joke that, "Well, if there's a correlation between sales volume and smoke pH, the marketing people are going to fly in the door and say, 'Oh, well dump more pH. Where can I buy a bottle of pH?'"

I think we've -- there -- there are many people at Reynolds, including myself, who have been skeptical of the whole notion, which has caused me to go back and look at some hard data --

Q. When did you do that?

A. -- such as we have.

Q. When did you do that?

A. The Winston data was accumulated by one of my staff members in 1994, I believe, which really was

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prompted in large part because of the FDA allegations.

Q. So in other words, the first investigation that you did was in response to the FDA saying that -- accusing RJR of manipulation, and so you went back in a defensive mode and tried to justify your use of ammonia --

A. I wasn't trying --

MR. PLESEC: Objection.

Q. -- for the last 15, 20 years; correct?

MR. PLESEC: Objection.

A. I wasn't trying to justify the use of ammonia. I was trying to see what historical data we had, collect it and see what happened.

Q. I'm going to show you a document that's been previously marked as Plaintiffs' Exhibit 1094. This is to -- this is a document that's Bates stamp numbered 50443 8506 through 8512.

Have you seen this document previously?

A. Yes, I have.

Q. This is a document sent by an E. Bernasek and a C. W. Nystrom to a Dr. G. R. DiMarco; correct?

A. That appears to be correct.

Q. And who is E. Bernasek?

A. That's Dr. Ed Bernasek, a retired employee from

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Reynolds.

Q. What is --

A. He was -- he was not retired at this time, I believe.

Q. What is his Ph.D. in?

A. He's an organic chemist.

Q. And who is C. W. Nystrom?

A. That's Dr. Charles Nystrom, also a chemist.

Q. So this is a memo written by two Ph.D. chemists to Dr. G. R. DiMarco. Who is Dr. G. R. DiMarco?

A. Dr. DiMarco was executive vice president in charge of R&D.

Q. And what was his Ph.D. in?

A. Actually I believe he had a Ph.D. in food science.

Q. Do you know what that involves?

A. Involves? No, I don't.

Q. I mean, what --

I mean, is that a combination of chemistry, organic biology? Do you happen to know?

A. Well I think -- I'm -- I'm just guessing. I think food science covers a number of fields, including chemistry, agriculture and a variety of other things. Dr. DiMarco was -- I believe had his Ph.D. in food science. He was a professor in the

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area of food science as well before he came to R.J. Reynolds.

Q. And at this time he's an executive vice president in charge of research and development; correct?

A. At what time?

Q. At the time this memo was written.

A. I don't know the exact date on this document.

Q. Page two of the document, Bates number 8507, lists at the top "8-9-82"; correct?

A. He would have been at R.J. Reynolds in 1982.

Q. And his position would have been --

A. Same, executive vice president of R&D.

Q. Okay. And this is identified --

The attached position paper is identified as a position paper "describing our rationale for using the following additives in RJRT tobacco flavor formulations"; correct?

A. That's what it says.

Q. And the attached document starting at Bates number 8507 involves ammonia; correct?

A. Yes, that's correct.

Q. It states at the top of that page that "Ammonia is used by RJRT in the following tobacco processing operations.

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"(1) Denicotinization of burley tobacco

"(2) Ammoniation of reconstituted tobacco";

correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. Let's look at page 8509. This is entitled "Ammoniation of Reconstituted Tobacco"; correct?

A. That's correct.

Q. It states that "Studies on the ammoniation of reconstituted tobacco were started in 1973 as a result of R&D studies carried out during the 1950's and" the -- "and early 1970"; correct?

MR. PLESEC: Objection.

A. You've read that correctly.

Q. "During the 1950's, Dr. C. E. Teague, Jr. investigated the ammoniation of tobacco and tobacco stems and reported dramatic improvements in the smoking qualities of ammoniated tobacco stems"; correct?

MR. PLESEC: Objection.

A. That's correct.

Q. It says "Smoke harshness and irritation were reduced and taste properties were improved"; correct?

MR. PLESEC: Objection.

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A. That's what it says.
Q. It then states "In the early 1970's, a major R&D program was initiated to investigate the physical chemistry of tobacco and tobacco smoke in an attempt to gain a better understanding of the factors affecting smoke harshness, irritation and strength"; correct?
MR. PLESEC: Objection.
A. That's what it says.
Q. "These studies led to the folllowing observations and conclusions"; correct?
MR. PLESEC: Objection.
A. Right.
Q. One is "The pH of cigarette smoke is important to smoke quality and can be used as a measure of the physiological strength of smoke"; correct?
MR. PLESEC: Objection.
A. That's what it says.
Q. And physiological strength, again going back to previous documents, is basically -- basically equivalent to what's been called nicotine kick; correct?
MR. PLESEC: Objection.
A. Well again I think some people might make that equivalence. Maybe some people wouldn't.

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Q. Okay. Number two states that "Ammonia in smoke is one of the major pH controlling components"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. Let's look on number four on page 8510. "Philip Morris introduced the use of added ammonia in their cigarette products in 1965. They use diammonium hydrogen phosphate in their reconstituted tobacco process to liberate ammonium pectinate prior to casting a reconstituted tobacco sheet"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. Is diammonium hydrogen phosphate the equivalent of diammonium phosphate, referred to as DAP?

A. Yes.

Q. "(5) Philip Morris brands, especially Marlboro, began growing in sales very rapidly after the introduction of added ammonia"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. It states that "Correlation studies relating increased smoke pH to sales trends showed a very strong positive correlation"; correct?

MR. PLESEC: Objection.

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A. That's what it says.
Q. It then says at seven that "Studies of the effect of ammonia on smoke composition showed a reduction in aldehydes, especially formaldehyde, and an increase in the levels of pyridines, pyrazines, and minor alkaloids"; correct?
MR. PLESEC: Objection.
A. That's what it says.
Q. "Smoking panel results showed a decrease in smoke irritation and harshness and an increase in physiological satisfaction with increasing ammonia content"; correct?
MR. PLESEC: Objection.
A. That's what it says.
Q. And physiological satisfaction is caused by nicotine; correct?
MR. PLESEC: Objection.
A. Well some people might think that.
Q. That's what's been stated in documents we've seen here today; correct?
MR. PLESEC: Objection.
A. As I said, some people probably conclude that.
Q. Okay. It then states that based upon -- and again those people are RJR employees; correct?
A. Some are. Some are.

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Q. It then states that "Based on the above observations, it was decided to investigate the use of ammoniated reconstituted tobacco (G7A) as a means of increasing the smoke pH of RJRT's cigarette products"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. "NFO tests indicate that smokers prefer products containing G7A over products containing only G7," parenthetical, "(untreated reconstituted tobacco)," end parenthetical; correct?

MR. PLESEC: Objection.

A. I believe that's correct. That line is real shaky on my copy.

Q. Highlight it. It makes it a little bit easier to read.

A. Okay.

Q. Does that help a bit?

A. Yeah, it did actually. That's clever.

Q. Let me just read it again --

A. All right.

Q. -- just so we're accurate. It states "NFO tests indicate that smokers prefer products containing G7A over products containing only G7," parenthetical, "(untreated reconstituted tobacco)"; correct?

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MR. PLESEC: Objection.

A. That's an accurate reading.

Q. It states that "Since the introduction in CAMEL Filter in 1975, G7A has been tested and/or introduced in nineteen additional brands"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. And the Camel Filter, the ammoniated tobacco was introduced commercially in the Camel Filter in 1975; correct?

A. I have -- I have no reason to doubt that.

Q. Ammonia has been added to reconstituted sheet, otherwise known as G7, since 1975 up through 1994; correct?

MR. PLESEC: Objection.

A. Well I -- I have no reason to doubt that -- that it was introduced in 1975 in Camel. I don't recall the exact date that G7-A was discontinued.

Q. Okay. And ammonia has been added to cigarettes commercialized by R.J. Reynolds since 1975 through 1994; correct?

MR. PLESEC: Objection.

A. I think that's a fair assumption.

Q. Ammonia has been added to G7 sheet in two fashions. One, gaseous ammonia's been added to

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reconstituted G7 sheet; correct?

A. That's correct.

Q. And two, diammonium phosphate, often shown in documents just by its initials, capital D, capital A, capital P, has also been added to G7 reconstituted sheet; correct?

A. That's correct, in some formulations.

Q. I'd next like to show you a document that's been previously marked as Plaintiffs' Exhibit 1152*, and I believe we're going to renumber this as 1152-A. This is a document Bates stamped 50806 2474 through 2493.

Have you seen this document previously?

A. I don't remember seeing this document.

Q. Okay. This is entitled on the front page "REVIEW OF G-7 PROCESS AND PRODUCT DEVELOPMENT PROGRAMS, October 16, 1991"; correct?

A. That's what it says, that's correct.

Q. Let's look on page 2477. The objective is listed as "Develop a reconstituted tobacco sheet which provides product benefits and maximum utilization of available materials and by-products"; correct?

A. That's a correct --

MR. PLESEC: Objection.

A. -- correct reading.

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Q. On the next page it's stated "QUALITY PREMISE"; correct?

MR. PLESEC: Objection.

A. Yes.

Q. It states that "G-7 is the largest blend component"; correct?

MR. PLESEC: Objection.

A. Yes.

Q. And was that your understanding as of 1991?

A. I wouldn't think in 1991 or even today that G7 would be the largest blend component --

Q. So is this document --

A. -- for most cigarettes.

Q. -- wrong?

A. I'd have to go back and look at blend sheets. I know that there are a few specific brands that have had very high G7 levels. I think those are -- those have been rare examples. Certainly the levels of flue-cured and burley tobacco I think typically are the largest two single blend components.

Q. Let's go to page 2481.

A. Okay.

Q. 2481 first talks about -- well it talks about and lists various types of G7; correct?

A. It lists five different G7 formulations.

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Q. Okay. The first G7 formulation listed is G7-A; correct?
A. That's correct.
Q. It's stated that that was "Ammoniated sheet"; correct?
A. That's one of the dots under it.
Q. And it indicates that there was a change to smoke pH as a result of the ammoniation; correct?
A. That's what it says.
Q. And "Addressed hot/harsh smoking attributes"; correct?
A. That's what it says.
Q. Now G7-A was replaced by G7-7; correct?
A. That's what this document says.
Q. Okay. And there it's the extract as opposed to the sheet that's ammoniated; correct?
A. I believe so.
Q. And just so the jury understands, the reconstituted sheet, G7, is manufactured by taking bits and pieces of tobacco that can't be used in a cigarette as they are, extracting them with water to obtain the solubles out of those bits and pieces, using a papermaking process to reform those bits and pieces into basically tobacco sheet and then reapplying the extract removed back to that sheet;

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correct?

MR. PLESEC: Objection.

A. I think that's a reasonable simple description of the G7 process.

Q. And during --

Once the extract is removed, I think we've talked earlier that it's placed in some kind of a holding tank.

A. Yes.

Q. And it's at that spot where ammoniation -- where ammonia is added under the G7-7 process; correct?

A. I think that's correct.

Q. Okay. Now is that gaseous ammonia?

A. I believe G7-7 was gaseous ammonia.

Q. Okay. And it was gaseous ammonia that was also used in the G7-A; correct?

A. I believe so.

Q. Okay. There's also a reference here to G7-10.

A. That's correct.

Q. And that indicates that diammonium phosphate was added to that particular blend; correct?

A. That in -- indicates diammonium phosphate addition.

Q. When did G7-7 come on line?

A. I don't remember the exact date. I would say it

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was in the -- I don't know. I'd just be guessing.
Q. In the mid-'80s sometime?
A. I would have said the early '80s, but that's just a guess.
Q. When did G7-10 come on line?
A. That's hard for me to say, when it came on line. If you mean that it came on line commercially, I would say probably roughly in the mid to late '80s.
Q. And when I say "came on line," you understand that I'm -- I mean that it was first used in a commercial product?
A. Well that's why I was trying to clarify and that's why I used the word "commercially."
Q. Okay. And then the G7-25, there they heat treat the extract and add diammonium phosphate; correct?
A. That's correct.
Q. Do you know why the extract is heat treated?
A. Yes, I do.
Q. And why is that?
A. To initiate reactions between diammonium phosphate and certain sugars.
Q. Let's look on page 2484. Under "OBJECTIVE" it states "Impart a smoother less harsh character to RJR brands through G-7 modifications"; correct?

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MR. PLESEC: Objection.

A. You've read that correctly.

Q. And the technical approaches are "Extract Heating" and "DAP addition," parenthetical, "(pH adjustment)"; correct?

MR. PLESEC: Objection.

A. That's what it says.

Q. And is that what was done in the G7-25 process?

A. Is what what was done?

Q. DAP added for pH adjustment.

A. In the G7 which?

Q. 25.

A. I don't believe so. I believe that -- that DAP was added and then the extract was heated to initiate reactions with sugars. We know that ammonia compounds or ammonia itself can react very efficiently with some sugars to produce a class of compounds we call pyrazines, which are very flavorful compounds. I believe that that was the reason for this approach.

Q. Let's look on the next page.

A. Okay.

Q. 2485.

A. Okay.

Q. This would indicate that in addition to DAP,

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ammonia itself is also added to the extract; correct?

MR. PLESEC: Objection.

A. That's what this suggests, sure.

Q. Okay. "EXTRACT PH ADJUSTED TO 6.0 WITH NH3"; correct?

A. Well that's what this says.

Q. And that's ammonia; right?

A. NH3 is ammonia gas.

Q. And DAP was added in addition to the ammonia gas; correct?

MR. PLESEC: Objection.

A. That's what this chart suggests.

Q. Okay. And that resulted in the G7-25; correct?

A. That's correct, according to this -- to this chart. I -- I don't think it in -- includes any relative measure of the level of DAP addition or the level of NH3 addition because this may be -- it may be that this is an adjustment of that solution pH to encourage the reactions that I was suggesting earlier.

Q. It doesn't really say that, though, does it?

A. No, it really doesn't, and that's why I wanted to point that out.

Q. In fact, it just points out that you are

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adjusting the pH of that solution to 6 with ammonia and that adding on top of that ammonia DAP; right?
A. As a chemist, I would look at it the other way around. You mix DAP in the extract solution. Then you have the reactants present in that kettle. You adjust the pH, if need be, with some base like ammonia. To encourage the reactions, you heat treat it. Well I guess you've already heat treated it.
Q. Yeah. This is in the cooling phase; right?
A. Okay. So I don't -- I don't completely understand this, I suppose.
Q. Yeah. It actually looks that the --
A. The only thing -- I'm sorry. The only thing I would point out is that it's not clear the relative levels of DAP addition and ammonia. I'd be interested in seeing that because I -- it's been a long time --
Q. But what is --
A. -- since I've thought about this.
Q. What is clear is that the DAP and the ammonia are added after this extract has been heated; correct?
MR. PLESEC: Objection.
A. That's what this appears to be. That wasn't my understanding of this process.

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Q. G7-25, was that used in a commercial product?
A. I believe it was.
Q. Do you know which commercial products?
A. I'm certain we could find out. I don't recall offhand, though.
THE REPORTER: Dan, it's 5:30.
MR. O'FALLON: Okay. Why don't we stop and wait until tomorrow.
THE REPORTER: Off the record, please.
(Deposition recessed at 5:29 o'clock p.m.)

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C E R T I F I C A T E

I, William C. LaBorde, hereby certify that I am qualified as a verbatim shorthand reporter; that I took in stenographic shorthand the testimony of DAVID TOWNSEND at the time and place aforesaid; and that the foregoing transcript consisting of pages 422 through 486, Volume IV, is a true and correct, full and complete transcription of said shorthand notes, to the best of my ability.

Dated at Minneapolis, Minnesota, this 2nd day of October 1997.

WILLIAM C. LaBORDE
Registered Professional Reporter
Notary Public

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C E R T I F I C A T E

I, DAVID TOWNSEND, the deponent, hereby certify that I have read the foregoing transcript consisting of pages 422 through 486, Volume IV, and that said transcript is a true and correct, full and complete transcription of my deposition, except per the attached corrections, if any.

(Please check one.)

____ Yes, changes were made per the attached (no.) ____ pages.

____ No changes were made.

DAVID TOWNSEND
Deponent

Sworn and subscribed to before me this day of 199__.

Notary Public

My commission expires: (WCL)

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